DOCUMENT RESUME

ED 194 103 IR 008 980

AUTHOR Boker, John R.
TITLE Evaluating Student Performance and Attitudes in Response to Videotaped Self-Instruction.
PUB DATE 9 Nov 78
NOTE 17p.: Paper presented at the Annual Meeting of the Mid-South Educational Research Association (7th, New Orleans, LA, November 9, 1978).

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Attitude Change: *Cognitive Development: Cognitive Processes: Educational Attitudes: Higher Education: *Independent Study: Medical Education: *Student Attitudes: *Videotape Recordings

ABSTRACT

This study evaluating an innovative technique for the education of medical students emphasized the measurement of 30 senior medical students' cognitive and affective behaviors in response to their experiences over a period of six weeks with videotaped self-instructional programs. An investigation was made of: (1) the students' gain in knowledge, (2) the extent to which this type of instruction did in fact enhance attitude changes toward specific content referents, and (3) the students' attitudes toward this particular method of instruction. On the basis of results obtained, it was concluded that the use of well-designed and validated videotaped self-instructional programs had produced desired instructional outcomes of a cognitive type and also comprised a generally acceptable method of instruction from the students' point of view. Further, it is observed that videotaped self-instructional programs can function as modest agents of attitude change, at least when measured on a short-term basis. References are provided. (Author/MER)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U S DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

ED194103

EVALUATING STUDENT PERFORMANCE AND ATTITUDES IN RESPONSE TO VIDEOTAPED SELF-INSTRUCTION

John R. Boker
School of Medicine
University of Alabama in Birmingham

Paper presented at the Seventh Annual Meeting of the Mid-South Educational Research Association, New Orleans, Louisiana, November 9, 1978.

Portions of this study were supported by contract N01-PE-24327 from the Division of Physician and Health Professions Education, DHEW.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
John R. Boker

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

I200880

Evaluating Student Performance and Attitudes in Response to Videotaped Self-Instruction

Many medical schools throughout the nation are currently participating in outreach medical education programs which are designed to alleviate the shortage of primary care practitioners in medically underserved regions of different states. One medical school, to accomplish that goal, has established a six-year combined B.S./M.D. curriculum with the following components: (a) an accelerated two-year premedical phase at a cooperating liberal arts college which is located in the remote training site region of interest , (b) a three-year phase which takes place at the medical school and includes the entire core curriculum of the medical school, and (c) a one-year phase during which senior medical students return to the remote site area of their pre-medical college training and participate in Family Medicine preceptorships. The office practices and clinics of the local physicians, as well as the facilities of the local community hospitals are the major teaching resources during the latter phase of the curriculum. However, the major contact of the medical school clinical teaching faculty with the senior medical students is through both an interactive telecommunications network and locally-produced videotaped self-instructional programs which are made available in learning resources centers in each remote training site. The remote training sites are located in rural areas approximately 90, 140, and 450 miles removed from the tertiary care medical center.

Over the past few years, the clinical faculty at the medical school, in cooperation with the Office of Medical Education and the Department of Communications in Medicine, has been planning, developing and producing a number of videotaped self-instructional programs to support the last phase of the curriculum described above. The specific topic and content of the programs

focuses upon patient management problem situations which are likely to be encountered by a local family practitioner. The specific problem list was determined in a separate study which surveyed physicians' practice profiles in the remote site training areas. Furthermore, all of the self-instructional programs were developed and produced according to the systematic instructional design approach suggested by THE NATIONAL MEDICAL AUDIOVISUAL CENTER (Craig, 1976). The NMAC model incorporates a series of decision making and evaluation stages which proceed from problem definition and performance (i.e., behavioral) objective specification through pre- and post-production review and field testing by students and faculty for the purpose of providing feedback for individual program revision and validation. Written materials in the form of study manuals containing specific performance objectives, pre- and posttest items with correct responses, suggested corrective actions, and important visuals charts, diagrams, etc.) were prepared concomitantly.

The need for an adequate student evaluation protocol becomes apparent when one considers: (a) the considerable time commitments of medical school clinical teaching faculty and support personnel (i.e., telecommunications and educational design consultants) required to produce a rather large volume of videotaped self-instructional programs. Conservative estimates indicate a range of fifty to one-hundred combined hours of clinical teaching faculty and educational and biomedical communications consultant time to plan, develop, produce and validate a single program.(b) the fact that for these medical students, at least, this mode of instruction is a relatively innovative one. That is, although the medical students are exposed to some videotaped instruction during the course of the regular medical school curriculum, such exposure is relatively unsystematic and considered a minor part of the curriculum. For the most part, it is voluntary on the student's part and limited to videotaped lectures that are used

simply for review purposes. This is considerably different in format and intent from the programs of interest here; namely, self-instructional programs which are a required part of the curriculum and intended as the primary sources of information about specific predetermined topics. In light of the above considerations, an evaluative research protocol was proposed which incorporates measures of the extent to which interaction with the self-instructional videotaped programs: (a) enables the students to attain the instructional objectives, and (b) influences the students' attitudes toward this rather innovative method of instruction at this institution.

The evaluation of instructional effectiveness, or the extent to which the programs enable the students to attain the instructional objectives (i.e., cognitive outcomes), can be formative or summative in nature. The former type of evaluation was built into the self-instructional program production process. That is, objective test items were constructed for each specific performance objective and administered in a field test on a pre- and posttest basis to a small group of senior medical students. Furthermore, student and faculty reviews during various production stages were used to validate the self-instructional programs. The major interest in the present study, however, was the summative evaluation of the overall effects of the videotaped self-instructional programs upon student performance.

In addition to enabling the students to attain the desired instructional objectives, a truly successful instructional method should also freely elicit positive student attitudes. Theoretically, attitudes are assumed to be both responses and stimuli for further responses that both initiate and maintain behavior (Staats, 1967). Positive attitudes toward a particular subject matter area suggest that students are more likely to expose themselves to, and delve more deeply into, the area than they would if attitudes were negative. Similarly,

positive attitudes toward a particular instructional method should imply that, when given the opportunity, students are more likely to engage in further learning activity with that instructional method. Negative attitudes, on the other hand, should imply that students are more likely to avoid studying by a particular method if given a choice in the future. Thus, the implication is that a particular instructional method ultimately will be unsuccessful even if such instruction results in the attainment of desired performance objectives because students can be expected to resist exposure to this type of instruction in a variety of ways (Tobias and Hanlon, 1975). A primary concern of the medical school clinical faculty was the efficacy of the widespread use of videotaped self-instruction in maintaining quality instruction. An evaluative research study was thus designed to be sensitive to both instructional effectiveness and student attitudes toward this method.

Method

Subjects

The subjects were 30 senior medical students who were to take the Family Medicine preceptorships at one of the rural remote training sites. Of the students, 16 were originally admitted to the medical school under the auspices of the outreach medical education programs and now were returning to the locale where they did their premedical education. This group would spend most of the next 48 weeks rotating through preceptorships in family practice, obstetrics/gynecology, pediatrics, and emergency care/surgery as required by the Family Medicine curriculum. The remaining 14 students originally were not admitted to the outreach medical education programs, but developed an interest in Family Medicine and volunteered to take one or more electives in the primary care specialties available in the remote training site.

Materials

Videotaped self-instructional programs. A previous survey of the practice profiles of the local physicians in the remote site training areas and a review of the literature (Rakel, 1975; Farley, 1975) suggested specific topics and content areas which were appropriate for prospective family practitioners. The clinical teaching faculty at the medical school then subjectively determined those topics which they felt were best taught by their tertiary care peers at the medical center rather than by the primary care physician preceptors in the remote sites. Twenty of the resulting topics were then developed into videotaped self-instructional programs (VS-IP) at the medical school prior to the first students' return to any remote site locality. Each VS-IP was developed around discrete, single concept patient management situations and attempted to increase the students' clinical knowledge about managing certain disease entities, making particular diagnoses, or performing some specified clinical tasks appropriate for the level of senior medical students. The programs had running times ranging from 12 to 33 minutes and were accompanied by written materials which were described earlier. The instructional design protocol that guided the production of the 20 programs followed standard procedures suggested by Briggs (1970) and Craig (1975).

Knowledge test. A pool of multiple-choice (MC) items, following NBME formats and each with four or five response options, was constructed based upon a task analysis of each VS-IP. The MC items were tried-out in the small group field testing of each VS-IP done prior to this study. From 4 to 7 items on each VS-IP were then randomly selected from the available pool of acceptable or revised MC items to comprise a 100-item knowledge test (KT) that was used to measure predicted student gains in clinical knowledge as a result of self-instruction by the videotaped programs. The reliability of the KT was found to

be .86 (K-R 20 method).

Attitude questionnaires. In the present study students' attitudes were defined in terms of both: (a) their degree of self-confidence in functioning within each clinical situation covered by an individual VS-IP, and (b) their acceptance of VS-IP as an instructional methodology. The former attitudes were measured by having the students rate their own knowledge and ability, at a given point in time, to perform specified clinical skills or procedures. That is, a 5-point Likert scale was constructed to measure the students' abilities to perform properly when confronted with clinical problems likely to be encountered in a Family Medicine setting. The skills rated on this scale were generated from task analyses on each of the 20 programs and required the students to indicate their self-perceived confidence in their ability to perform very specific clinical functions. Students responded by using the following scale values:

> 1 = no knowledge would not recognize syndrome or disease in its classic form, wouldn't know how to use the drug, wouldn't know anything about the procedure, etc.; 2 = might recognize or diagnose the disease in its classic form but would miss it in an unusual presentation, would need much help in selection of diagnostic tests and their interpretation; 3 = uncertain about my ability at this time; 4 = my basic understanding of this theory, disease, or condition is pretty good, able to recognize common and some unusual presentations of this condition, would feel comfortable with diagnosis/treatment, but might need some help, could do procedure if I had to on an emergency basis; 5 = feel comfortable in all aspects-

basic knowledge, diagnosis, treatment, long-term management. Comfortable with procedure-know indications and contraindications, can skillfully perform. Know usefulness and limitations of tests-no consultations required. Could counsel patient on this condition. Can do skillfully.

It was expected that the students who interacted with VS-IP would show increased confidence in each of the 20 clinical problem situations.

Students attitudes toward VS-IP as an instructional activity were measured at two different times. First, all students rated the program upon completion of each VS-IP. A standard rating form consisting of a 5-point Likert scale was used where: 1 = poor, 2 = fair, 3 = satisfactory, 4 = good, and 5 = excellent. Students rated the content of each VS-IP upon the following qualities: (a) interest and level of stimulation, (b) importance and relevance to the training of senior medical students, (c) clarity and organization, (d) appropriateness of the difficulty level in terms of their preparation and ability, and (e) scope and nonredundancy of information.

A second attitude toward VS-IP questionnaire was administered at the end of a fixed period of time by which all students were required to successfully complete all 20 programs. At this time, the students responded to a separate 6-item questionnaire that measured their overall perceptions of the usefulness and relevance of VS-IP as one teaching component in the Family Medicine preceptorships.

Procedure

Thirty senior medical students were randomly assigned to experimental (n=20) and control (n=10) groups through scheduling procedures. On the first day of the academic year all students were pretested as part of a general orientation program at one remote training site. The following instruments were administered:

(a) a three-hour, 200-item MC examination. This consisted of a 100-item subtest (KT) measuring proficiency on the specific cognitive instructional objectives covered by VS-IP which was embedded randomly in another separate 100-item examination. The latter was one subtest from the Core Content Review of Family Medicine (Donnelly, 1976), an in-training assessment that was being used for other evaluation purposes. (b) an attitude questionnaire where the students rated on a Likert scale their own perceived self-confidence in performing 20 discrete patient management functions. The 20 clinical functions were those covered by VS-IP, and the list was embedded in a rather lengthy checklist of clinical skills and abilities (approximately 150 total items were rated by each student).

The experimental group then was assigned for the next six weeks to Family Medicine preceptorships. One requirement by the end of this six weeks was to complete successfully all 20 VS-IP which were made available in remote site learning resources centers. Successful completion was defined internally according to each individual VS-IP; however, the criterion level was generally set at 90% — students who did not initially attain criterion on any VS-IP were directed to review certain sections as needed. As an honor system was in effect, no direct record of student performance on each VS-IP was maintained. However, three sources of archival data support the conclusion that all students did in fact interact with each VS-IP. They were: (a) student logs of daily activities, (b) check-in and check-out records at the learning resources centers, and (c) the fact that all 20 students completed and turned in a post-instructional rating form which was requested for each VS-IP.

Students in the control group were assigned to either primary care electives or vacation periods for the same 6-week period. Following the initial six weeks of the Family Medicine preceptorships, all students were then posttested

with the same orientation instruments described above. At this time, however, the experimental group also completed another brief questionnaire that pertained to their general attitudes toward, and general acceptance of VS-IP as an instructional method.

Results

A dependent *t* test comparing both the knowledge test mean scores and the self-confidence mean ratings for the experimental group indicated a significant increase (alpha=.01) from pre- to posttesting. Similarly, an independent *t* test also yielded significantly greater posttest means for both measures when comparing the experimental and control groups. No other differences were significant, as shown in Table 1.

Table 2 summarizes the students' mean ratings of each VS-IP on five qualities. These ratings were obtained immediately after the students completed each individual VS-IP during the initial 6-week preceptorship experience for the experimental group. As shown in Table 2, the experimental group produced postinstruction mean scores which were all in the positive direction on the individual items comprising the attitude toward individual VS-IP questionnaire.

Finally, the results of the postpreceptorship mean ratings of the students' general acceptance of VS-IP as one method of instruction are shown in Table 3. Again, the use of VS-IP appears to have evoked positive responses from the students in the experimental group. Although comparative data are not produced here, experience has shown that the obtained mean ratings on items 1, 2 and 5, in particular, are considerably higher than those typically obtained when students are asked to rate other medical education activities of a similar nature.

- -

Insert Tables 1, 2 and 3 about here

- -

Discussion

On the basis of the results obtained in this study, using a single set of 20 instructional programs, it was concluded that the use of well-designed and carefully validated videotaped self-instructional programs is an effective method of remote site instruction for senior medical students in terms of: (a) assisting students in the attainment of cognitive performance outcomes, (b) serving as agents of change with respect to attitudes of self-confidence in one's own ability to function in specified clinical situations, and (c) eliciting positive attitudes of student acceptability in general.

Some degree of attitude change is a likely by-product of almost any instructional experience, and students' attitudes should provide an important source of data in the evaluation of instruction. Typically, however, when instructional methods and programs are evaluated, the primary focus is upon the degree to which cognitive performance outcomes are accomplished. Yet, critical tests of whether an instructional method or program is ultimately successful or unsuccessful may be the nature and the degree of the attitudes that students form concerning that method or program. The present evaluation study incorporated both cognitive and attitudinal components and functioned as a viable and comprehensive way of determining the effectiveness of a relatively innovative instructional method. The results of this study provide evidence favoring the use of students' attitude ratings for evaluating instructional methods. Comparable results were obtained in a generally similar study done by Tobias and Hanlon (1975). The implication from both studies is that students' attitudes toward a particular method of instruction appear to be highly related to the likelihood that the students will want to undertake further study by the same instructional method if given a choice in the future. Indeed, the concept of life-long, continuing, self-learning for physicians points out the importance

of this implication.

However, one must be cautioned that students attitudes such as positive ratings and acceptance in general--or in the study by Tobias and Hanlon, intentions to take further study by a particular instructional method--do not require a real commitment on the students' parts to actually do so. Fishbein (1971) reports that actual behavior correlates as high as .90 with intention but only when that intention is a commitment to a highly specific behavior. Clearly, such was not the exact situation in the present study.

Table 1

Mean Student Knowledge Test Scores and Confidence Ratings

Group	m	Pretest M	Pretest SD	Posttest M	Posttest SD	t
			Knowledge Test[a]			
Experimental	20	40.55	11.61	68.15	10.61	28.89*
Control	10	38.60	8.50	41.40	6.35	1.98
			Confidence Ratings[b]			
Experimental	20	1.84	.71	3.66	.41	6.62*
Control	10	1.84	.55	1.94	.63	1.92

[a] Maximum score = 100

[b] Maximum rating = 5.0

*$p < .001$

Table 2

Mean Student Ratings of Each
Videotaped Self-Instructional Program on Five Qualities

Program	Program Qualities[a]						
	Interest/ Stimulation	Relevance/ Importance	Clarity/ Organization	Difficulty	Scope	M	SD
1	3.25	3.40	3.65	2.85	3.05	3.24	.31
2	3.15	3.70	2.55	3.15	2.75	3.06	.44
3	2.85	3.35	3.90	2.95	3.00	3.21	.43
4	4.20	3.80	3.85	3.50	4.05	3.88	.27
5	4.10	3.60	3.95	3.80	3.85	3.86	.19
6	2.95	3.25	3.65	3.15	3.25	3.25	.25
7	3.65	4.00	3.05	3.80	4.05	3.71	.40
8	3.60	4.25	2.85	3.80	3.95	3.69	.53
9	4.40	4.15	3.25	3.95	4.20	3.99	.44
10	3.75	4.40	3.70	4.40	4.20	4.09	.34
11	2.80	2.90	3.45	3.20	2.95	3.06	.26
12	3.20	3.25	2.95	2.85	3.00	3.05	.17
13	3.80	4.40	3.60	3.85	4.20	3.97	.32
14	2.85	3.85	3.30	3.55	3.45	3.40	.37
15	3.45	3.35	4.50	2.75	3.00	3.41	.67
16	4.25	4.40	3.95	4.05	4.00	4.13	.19
17	4.75	3.95	3.70	4.20	3.80	4.08	.42
18	4.55	4.40	4.15	3.85	4.00	4.19	.29
19	4.00	3.70	2.95	3.80	3.60	3.61	.39
20	3.75	4.25	4.00	4.25	4.15	4.08	.21
M	3.67	3.82	3.55	3.59	3.63	Grand Mean = 3.65	
SD	.60	.46	.50	.51	.26		

[a]Each entry is based on n = 20; maximum rating is 5.0

Table 3

Student Postpreceptorship Ratings
of Videotaped Self-Instructional Programs

Item Description	Frequency Chosen					M	SD
	1	2	3	4	5		
1. How essential are the videotaped self-instructional programs as learning experiences during the preceptorship? (1=not needed at all, 5=indispensable)	0	0	3	12	5	4.10	.64
2. How much did the videotaped self-instructional programs contribute to your medical education in this preceptorship? (1=very little, 5=a great deal)	0	1	4	7	8	4.10	.91
3. Did the videotaped self-instruction make it more efficient or easier for you to acquire clinical skills and knowledge during the preceptorship? (1=offered no particular advantage, 5=very helpful and convenient)	1	2	7	5	5	3.55	1.15
4. In general, the time spent in working through the videotaped self-instructional programs has been ____? (1=a poor use of my time, 5=a good use of my time)	0	0	2	8	10	4.40	.68
5. How would you rate the overall value of the videotaped self-instructional programs as used in the preceptorship? (1=poor, 5=excellent)	0	0	2	6	12	4.50	.69
6. To what extent should videotaped self-instructional programs be used in the Family Medicine preceptorship in the future? (1=discontinue altogether, 2=decrease use somewhat, 3=use at about the same level, 4=increase use somewhat, 5=increase use greatly)	0	0	12	5	3	3.55	.76

References

Briggs, L.J. Handbook of procedures for the design of instruction. Washington, D.C.: American Institutes for Research, 1970.

Craig, R.S. Procedures for developing self-instructional units. Atlanta: National Medical Audiovisual Center, 1975.

Donnelly, J.E. The core content review of family medicine. Connecticut and Ohio Academics of Family Physicians, 1976.

Fishbein, M. Attitude and the prediction of behavior. In M.K. Thomas (Ed.), Attitudes and Behavior. Harmondsworth, Middlesex, England: Penguin, 1971.

Rakel, R.E. Training of family physicians. J. Med Educ., 1975, 50, 145-153.

Staats, A.W. An outline of integrated learning theory of attitude formation and function. In M. Fishbein (Ed.), Readings in attitude theory and measurement. New York: Wiley, 1967.

Tobias, S. and Hanlon, R. Attitudes toward instructors, social desirability, and behavioral intentions. J. Educ. Psych., 1975, 67, 3, 405-408.